CCS Technical Documentation
RH-27 Series Transceivers

Troubleshooting – Antennas

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Troubleshooting – Antennas

This troubleshooting guide addresses potential failures that will affect the antenna performance of the RH-27 phone, and discusses methods for correction of these failures.

Failures and Corrective Measures

Appearance of phone

Figure 1: Front and back views of the RH-27 (6225) phone

Missing internal antenna or antenna radiator

Figure 2: RH-27 (6225) phone with and without antenna cap

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Figure 3: RH-27 (6225) antenna cap with and without radiator

If the antenna cap is missing or there is a cap but it has no radiator, install a new antenna cap with radiator. If the radiator looks obviously damaged (dents, corrosion) or the slot in the radiator has a significantly different shape, then install a new antenna cap with correct radiator.

If no antenna or no radiator is installed, the antenna gain will be degraded by more than 25 dB.

Missing GPS antenna, damaged GPS feed/ground pin or damaged heatstick

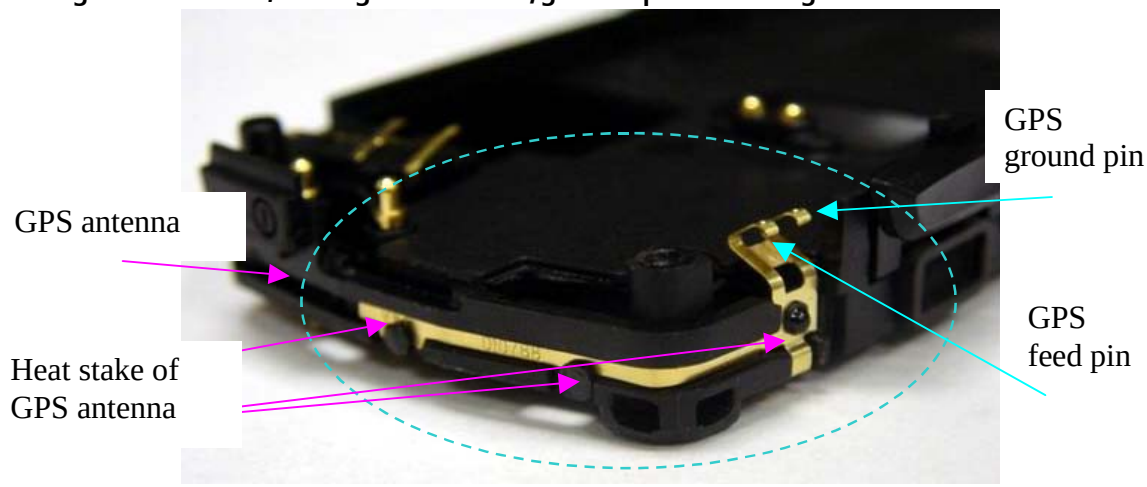

Figure 4: Back view of RH-27 (6225) C-cover with GPS antenna assembled

RH-27 GPS antenna is heat-staked to the C-cover. If any of the following events occurs, the entire C-cover assembly should be replaced with a new one:

1 GPS antenna is missing

2 GPS antenna looks obviously damaged

3 Any of the three heat stakes appears damaged; the GPS antenna will be loose

4 Any of the three heat stakes are over-heated and GPS antenna melts into the C-cover; antenna will look distorted and bent

5 Either GPS antenna feed or ground leg is broken or bent so that either pin will not touch the PWB.

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RF feed pin/ground pin, IHF speaker pins in C-cover missing or damaged

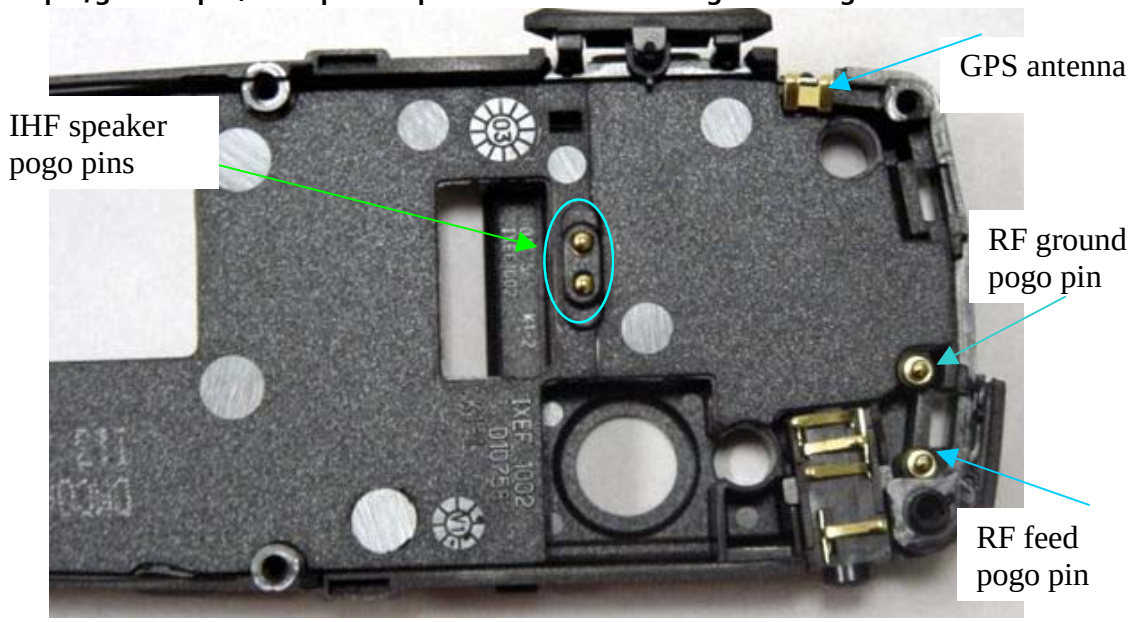

Figure 5: Inside view of the C-cover

Two pogo pins are inserted in the C-cover. One end of the pogo pin touches the antenna, the other end (in Figure 5) touches the pad on the PWB. If either of the pogo pins is missing, or either of the pogo pins is obviously damaged (stuck in the C-cover plastic tube, loose the inside spring force), the antenna will lose the contact to the PWB. Replace the whole C-cover assembly with a correct new one.

If the RF feed doesn't touch the PWB, then the antenna gain will degrade by more than 25 dB. If the ground pin doesn't touch the PWB, then the antenna gain may degrade about 5 to 10 dB.

If either of the IHF speaker pins is damaged or missing, the speaker will not connect to PWB. Antenna PCS gain will drop 2 dB. The C-cover assembly should be replaced.

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Obstructed RF feed and ground pads, GPS feed and ground pads, IHF speaker pads

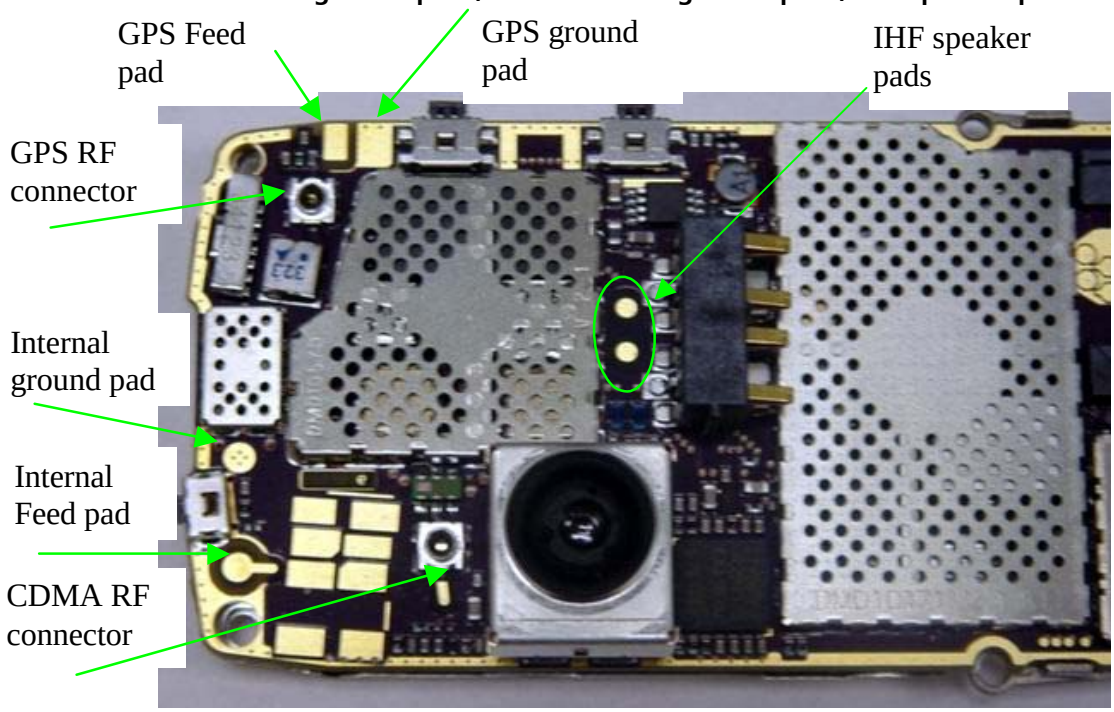

Figure 6: PWB layout of RF feed/ground pads, GPS feed/ground pads, and IHF speaker pads

If the RF feed pad is obstructed, removed, or covered, then the internal antenna feed pogo pin will not touch the PWB and the antenna gain will degrade by more than 25 dB. If the ground pad is obstructed, removed, or covered, then the ground pogo pin will not touch the PWB and the antenna gain will degrade by more than 5 dB. If corrosion is present or the pad is missing, then the PWB and phone most likely needs to be replaced. If either pad is obstructed or covered, the pad should be cleared and/or cleaned.

If the GPS feed pad is obstructed, removed, or covered, then the GPS antenna feed leg will not touch the PWB. If the ground pad is obstructed, removed, or covered, then the ground spring clip will not touch the PWB.

If the Internal Hands Free (IHF) speaker pads are obstructed, removed, or covered, then the IHF speaker will not produce sound. The antenna PCS gain will be degraded by about 2 dB. If corrosion is present or the pad is missing, then the PWB and phone most likely needs to be replaced. If either pad is obstructed or covered, the pad should be cleared and/or cleaned.

CDMA or GPS RF connector failure

CDMA and GPS use the same type of RF connector. The RF connector could fail by not connecting the RF input to the RF output of the RF connector. If this happens to the CDMA RF connector, then the antenna gain will degrade by about 25 dB. If this happens to the GPS RF connector, the GPS antenna gain will degrade by about 20 dB. This can be checked by testing for DC conductivity between the RF input and RF output of the RF connector. Note the DC conductivity test must be done without any cable attached to the RF connector. Since the RF connector is also a switch, the RF output will be disconnected from the RF input when a cable is inserted into the RF connector. When a cable is not inserted, the RF input is connected to the RF connector. The locations of both RF

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connectors are shown in Figure 6.

CDMA RF input – connects to duplexer

CDMA RF output – connects to antenna pad through vias

GPS RF input – connects to GPS ceramic filter output

GPS RF output – connects to GPS antenna matching circuits

RF connector – connects to coaxial cable

If the RF input is not connected properly to the RF output, then the RF connector must be replaced.

Display Assembly

Grounding of the display shield and frame

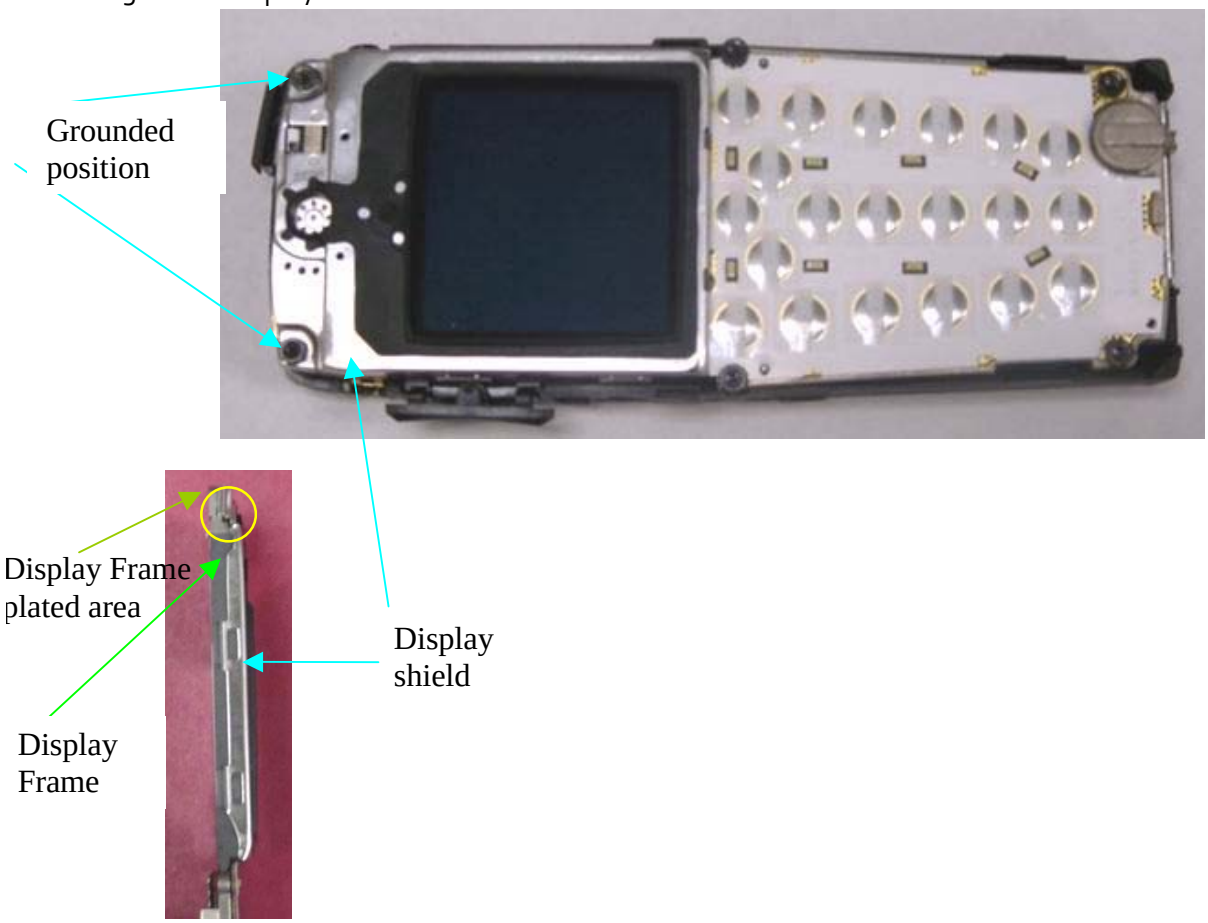

Figure 7: RH-27 display assembly (above, right) and side view of RH-27 display assembly (above, left)

The display shield is connected to the display frame plated area (screw boss area) and then the the PWB through the two top screws. The grounding of the display shield and frame will impact the radiation performance of the phone. If the screws are loose, tighten them. If the screw bosses are stripped, the chassis will need to be replaced. If the screws are missing, install new ones.

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If the display frame plated area is cracked or the metal plating is peeled off, then the grounding of the display shield and frame will not be guaranteed. Replace the frame.

Wrong display assembly installed

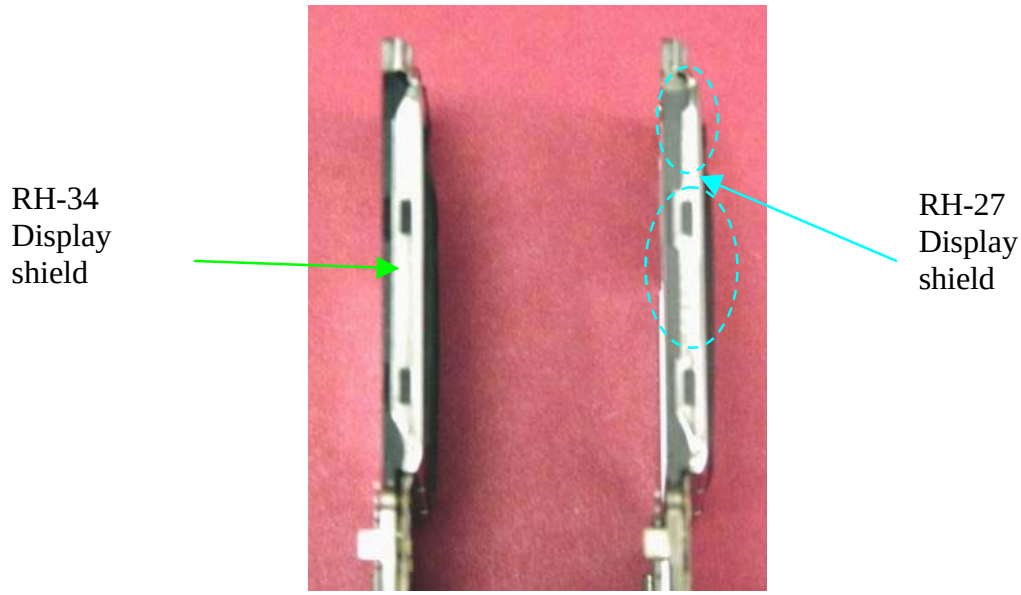

Figure 8: Side view of RH-34 and RH-27 display assembly

Figure 9: Back view of RH-34 and RH-27 display assembly

Display assemblies of RH-34 (6585) and RH-27 (6225) are very similar. However, the RH-27 display shield is different on the side from the RH-34 shield, as shown in Figure 9 inside the blue dashed line. Second, the metal plating at the top area of the RH-27 frame is different from the top of the RH-34 frame, as shown in Figure 9 inside the blue dashed line. For RH-34 frame, the screw boss area is plated but isolated from the rest of the frame, and also there is no plating in the area inside the green dashed line in Figure 9.

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For the RH-27 frame, the whole top area is fully plated.

If the wrong display shield or frame is installed, replace it with a correct one.

Missing or damaged baseband shield

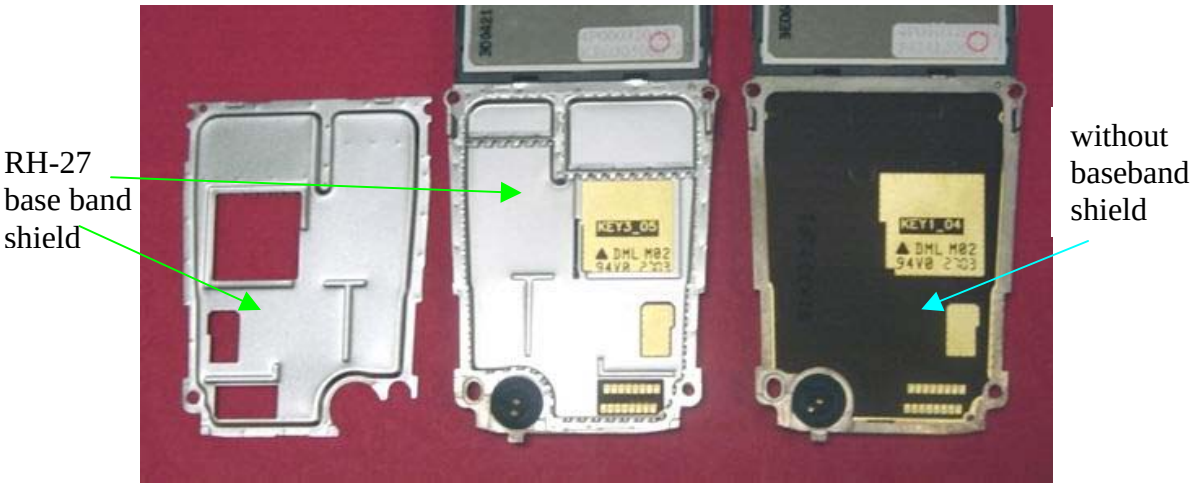

Figure 10: RH-27 baseband shield assembly

Baseband shield is part of the display assembly. If the baseband shield is missing or is obviously damaged, the radiated phone performace will be impacted. Check spring fingers on baseband shield to ensure that they are raised up so that when installed, they make contact with the PWB. If damaged, install a new baseband shield.

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